

PATENT ABSTRACTS OF JAPAN

(11)Publication number : 2001-172515

(43)Date of publication of application : 26.06.2001

(51)Int.Cl.

C08L101/16
C08K 5/57

(21)Application number : 11-362936

(71)Applicant : NITTO KASEI CO LTD

(22)Date of filing : 21.12.1999

(72)Inventor : OKADA TAKAYUKI
NAKAMURA HIROMASA
TABUCHI HITOSHI
MORI KIYOMI

(54) MOISTURE-CURABLE COMPOSITION

(57)Abstract:

PROBLEM TO BE SOLVED: To provide a modified-silicone-based moisture-curable composition of which the stability of a cure catalyst is excellent.

SOLUTION: This composition mainly comprises (A) 100 pts.wt. silyl-group- containing organic polymer having at least one silicon atom bonded to a hydrolyzable group at the molecular end or in the side chain and (B) 0.1-10 pts.wt. cure catalyst, provided the catalyst is a mixture comprising 80-50 wt.% dialkyltin compound and 20-50 wt.% silicate compound.

* NOTICES *

JPO and INPIT are not responsible for any damages caused by the use of this translation.

1. This document has been translated by computer. So the translation may not reflect the original precisely.
2. *** shows the word which can not be translated.
3. In the drawings, any words are not translated.

CLAIMS

[Claim(s)]

[Claim 1] A molecular terminal -- or -- a side chain -- hydrolytic -- a basis -- having joined together -- a silicon atom -- one -- a molecule -- inside -- at least -- one -- a piece -- having -- a silyl group -- content -- organicity -- a polymer -- (-- A --) -- 100 -- a weight section -- a curing catalyst -- (-- B --) -- 0.1 -- ten -- a weight section -- a basic component -- carrying out -- a constituent -- setting. A moisture curing nature constituent, wherein a curing catalyst (B) is a mixture of 80 to 50 % of the weight of dialkyl tin compounds, and 20 to 50 % of the weight of silicate compounds.

[Claim 2] A dialkyl tin compound is general formula: [(1)] $R^1_2 SnX_2$ (1).

(Among a formula, R^1 is straight chain shape or a branched-chain alkyl group with 1-12 carbon atoms, and) X Straight chain shape or a branched-chain alkoxyl group with 1-18 carbon atoms, a basis chosen from a group which consists of straight chain shape with an ORGANO silicate group and 1-8 carbon atoms or a branched-chain acetoacetic-acid-alkyl-ester group, and an acetylacetone group -- it is -- the moisture curing nature constituent according to claim 1 which is a compound expressed.

[Claim 3] A silicate compound is general formula [(2)] $R^2_2 Si(OR^3)_m$ (2).

(Among a formula, R^2 and R^3 are straight chain shape or branched-chain alkyl groups of the carbon numbers 1-4 independently, and, respectively) m R^2 and R^3 of an individual (4-m) may be the same, or may differ from each other -- m -- an integer of 0-3 -- it is -- the moisture curing nature constituent according to claim 1 which is a compound expressed or its hydrolyzate.

[Translation done.]

* NOTICES *

JP0 and INPIT are not responsible for any damages caused by the use of this translation.

1. This document has been translated by computer. So the translation may not reflect the original precisely.
2. *** shows the word which can not be translated.
3. In the drawings, any words are not translated.

DETAILED DESCRIPTION

[Detailed Description of the Invention]

- [0001]
[Field of the Invention] This invention relates to the moisture curing nature constituent excellent in the stability of a curing catalyst.
- [0002]
[Description of the Prior Art] As 1 liquid type moisture curing nature rubber, silicone series rubber, urethane system rubber, polysulfide system rubber, etc. are known. It is excellent that 1 liquid type moisture curing nature rubber generally has quick hardening, and does not have necessities, such as mixed adjusting of liquid, compared with a two-component thing etc. in respect of workability.
- [0003] However, the thing of silicone series rubber has a problem in respect of the possibility of the contamination to the circumference, and the paintwork to the surface, and the thing of urethane system rubber has a problem in respect of storage stability, weatherability, fizz-proof, discoloration, etc. There is a problem in respect of hardenability and the possibility of the contamination to the circumference also about polysulfide system rubber.
- [0004] Modified silicone system rubber is a polymer which has a hydrolytic silicon functional group which uses polyether etc. as a main chain, and for which a bridge can be constructed. Although it is stability under seal for a long period of time using a curing catalyst, when it exposes to humidity, it is 1 liquid setup-of-tooling product which hardens quickly and changes to a rubber-like substance (JP.62-35421, B, JP.61-141761, A, JP.1-58219, A).
- This polymer has storage stability, weatherability, fizz-proof, and good color fastness compared with a polyurethane system, compared with a polysulfide system, it excels in hardenability, there is little stain resistance to the circumference, and there is no toxicity. There is little stain resistance to the circumference compared with the usual silicone series, and the paintwork to the surface is good. Although a titanate compound, a tin carboxylate compound, an amine compound, etc. are known as a curing catalyst of the polymer which has this hydrolytic silicon functional group, generally the dialkyl tin compound is mainly used as a curing catalyst.
- [0005]
[Problem(s) to be Solved by the Invention] However, to moisture, these dialkyl tin compounds did not have enough stability, the storage stability of a constituent and the adhesive property, and the water resisting property were remarkably inferior in them, and the primer etc. needed to be used for them.
- [0006]
[Means for Solving the Problem] Then, this invention persons examined a denaturation silicone series moisture curing nature constituent which makes the main ingredients a curing catalyst and this excellent in handling nature and stability, and resulted in this invention.
- [0007] Namely, silyl group content organicity polymer (A) 100 weight section to which an invention concerning claim 1 has the silicon atom combined with a hydrolytic basis in [at least one] one molecule in a molecular terminal or a side chain, in a constituent which uses the curing catalyst (B) 0.1 - ten weight sections as a basic component, a curing catalyst (B) is related with a moisture curing nature constituent being a mixture of 80 to 50 % of the weight of dialkyl tin compounds, and 20 to 50 % of the weight of silicate compounds.
- [0008] In an invention which furthermore relates to claim 2, a dialkyl tin compound is general formula:
[(1)] $R^1_2SnX_2$ (1).

(Among a formula, R^1 is straight chain shape or a branched-chain alkyl group with 1-12 carbon atoms, and) X Straight chain shape or a branched-chain alkoxy group with 1-18 carbon atoms, a basis chosen from a group which consists of straight chain shape with an ORGANO silicate group and 1-8 carbon atoms or a branched-chain acetoacetic-acid-alkyl-ester group, and an acetylacetone group — it is — it is related with the moisture curing nature constituent according to claim 1 which is a compound expressed.

[0009] In an invention which furthermore relates to claim 3, a silicate compound is general formula



(Among a formula, R^2 and R^3 are straight chain shape or branched-chain alkyl groups of the carbon numbers 1-4 independently, and, respectively) m R^2 and R^3 of an individual (4-m) may be the same, or may differ from each other — m — an integer of 0-3 — it is — it is related with the moisture curing nature constituent according to claim 1 which is a compound expressed or its hydrolyzate.

[0010]

[Embodiment of the Invention] The silicon atom which combined with the molecular terminal or the side chain the organic polymer (A) used for this invention with the hydrolytic basis. It is a silyl group content organicity polymer which it has [(it may be hereafter called the silicon group combined with the hydrolytic basis) and] in [at least one] one molecule, and an alkylene oxide polymer thru-/or polyether, an ether ester block copolymer, etc. are mentioned as the main chain. The polymer of an ethylenic unsaturated compound and diene series, etc. are mentioned. As said alkylene oxide polymer thru-/or polyether, what has repeating units, such as $n(CH_2CH_2O)$ $n(CHCH_2CH_2O)$ $n(CHCH_2CH_2CH_2O)$ n ($CH_2CH_2CH_2CH_2O$) n , is illustrated. n is two or more integers here.

[0011] As a polymer of an ethylenic unsaturated compound and diene series, Homopolymers, such as ethylene, propylene, acrylic ester, methacrylic acid ester, vinyl acetate, acrylonitrile, styrene, isobutylene, butadiene, isoprene, and chloroprene, or two or more sorts of these copolymers are mentioned. More specifically Polybutadiene, a styrene butadiene copolymer, an acrylonitrile butadiene copolymer, an ethylene-butadiene copolymer, Ethylene propylene rubber, an ethylene-vinylacetate copolymer, an ethylene-acrylic ester copolymer, Polyisoprene, a styrene isoprene copolymer, an isobutylene-isoprene copolymer, Polychloroprene, a styrene chloroprene copolymer, an acrylonitrile chloroprene copolymer, polyisobutylene, polyacrylic ester, polymethacrylic acid ester, etc. are mentioned.

[0012] The silicon group combined with the hydrolytic basis is a basis which causes a condensation reaction by using a catalyst etc. if needed under existence of humidity and a cross linking agent. Specifically, a halogenation silyl group, alkoxy silyl groups, an alkenyl oxyalkyl group, an alkoxy silyl group, an amino silyl group, an amino oxyalkyl group, an oxime silyl group, an amide silyl group, etc. are mentioned. Here, the number of these hydrolytic bases combined with one silicon atom is chosen from the range of 1-3. The number of the hydrolytic bases combined with one silicon atom may be one, and that of them may be [two or more]. Furthermore, the hydrolytic basis and the non-hydrolytic basis may combine with one silicon atom. As a silicon group combined with the hydrolytic basis, handling is an easy point, and especially alkoxy silyl groups (mono- alkoxy silyl groups, a dialkoxy silyl group, and the Tori alkoxy silyl groups are included) is preferred. The silicon group combined with the hydrolytic basis may exist in the end of a polymer molecule, or may exist in the side chain. Even if the silicon group combined with the hydrolytic basis has few polymers per molecule, it is preferred that it averages per molecule from a point of a cure rate and hardened material nature, and there are 1.5 or more pieces with one piece although it is good. A method publicly known as a method of combining with said main chain polymer the silicon group combined with the hydrolytic basis is employable.

[0013] Although the molecular weight of the organic polymer (A) used by this invention does not have restrictions in particular, the thing of polymers is hyperviscosity, and since it becomes difficult [a use top] when it is considered as a hardenability constituent, 30000 or less are too desirable [a thing] as a number average molecular weight. Although such an organic polymer can be manufactured by a publicly known method, commercial items, such as KANEKA MS polymer by Kaneka Corp., may be used for it.

[0014] As a curing catalyst (B) used for this invention, the mixture of a dialkyl tin compound and a

silicate compound is used preferably. The mixture ratio of a dialkyl tin compound and a silicate compound is 80 to 50 % of the weight of dialkyl tin compounds, and 20 to 50 % of the weight of silicate compounds to both total quantity here. Even if the stabilization effect of a catalyst and a hardenability constituent is not enough in a silicate compound being less than 20 % of the weight and it adds mostly from 50 % of the weight on the other hand, the effect beyond it does not appear.

[0015]As a dialkyl tin compound, dialkyl tin dicarboxylate, a dialkyl tin JIARUKOKI side, A dialkyl tin screw (doria RUKOKISHI silicate), a dialkyl tin screw (monoalkyl dialkoxo silicate), Although a dialkyl tin screw (dialkyl monoalkoxo silicate), a dialkyl tin screw (trialkyl silicate), a dialkyl tin screw (acetylacetato), a dialkyl tin screw (alkyl acetooacetate), etc. are mentioned, Preferably A dialkyl tin JIARUKOKI side, a dialkyl tin screw (doria RUKOKISHI silicate), A dialkyl tin screw (monoalkyl dialkoxo silicate), a dialkyl tin screw (dialkyl monoalkoxo silicate), They are a dialkyl tin screw (trialkyl silicate), a dialkyl tin screw (acetylacetato), a dialkyl tin screw (alkyl acetooacetate), etc.

[0016] Especially, the dialkyl tin compound expressed with a general formula (1) is preferred. In a general formula (1), as straight chain shape or a branched-chain alkyl group with 1-12 carbon atoms expressed with R¹, methyl, ethyl, propyl, isopropyl, butyl, isobutyl, s-butyl, t-butyl, pentyl, and hexyl — it passes and PUCHIRU, octyl, 2-ethylhexyl, lauryl, etc. are mentioned. As straight chain shape or a branched-chain alkoxy group with 1-18 carbon atoms expressed with X, Methoxy and ethoxy ** propoxy, butoxy, isobutoxy, s-butoxy, t-butoxy, pentyloxy ones, hexyloxy one, heptyloxy, octyloxy, 2-ethylhexyloxy, lauryl oxy, stearyloxy, etc. are mentioned. as the ORGANO silicate group expressed with X — doria — RUKOKISHI silicate, monoalkyl dialkoxo silicate, dialkyl monoalkoxy silicate, trialkyl silicate, etc. are mentioned. As an alkoxy group, an alkoxy group with 1-4 carbon atoms is preferred here, Specifically Methoxy and ethoxy ** propoxy, isopropoxy, butoxy, Isobutoxy, s-butoxy, t-butoxy, etc. are mentioned, as an alkyl group, an alkyl group with 1-4 carbon atoms is preferred, and methyl, ethyl, propyl, isopropyl, butyl, isobutyl, s-butyl, t-butyl, etc. are specifically mentioned. The acetoacetic-acid-alkyl-ester group expressed with X means the univalent basis of the structure which was able to take one hydrogen atom of the methylene group of the 2nd place in acetoacetic acid alkyl ester. As straight chain shape or a branched-chain alkyl group with 1-8 carbon atoms in acetoacetic acid alkyl ester, methyl, ethyl, propyl, isopropyl, butyl, isobutyl, s-butyl, t-butyl, pentyl, and hexyl — it passes and PUCHIRU, octyl, 2-ethylhexyl, etc. are mentioned. The acetylacetone group expressed with X means the univalent basis of the structure which was able to take one hydrogen atom of the methylene group in an acetylacetone.

[0017] As a dialkyl tin JIARUKOKI side shown by a general formula (1). Specifically A dimethyl tin JIMETOKI side, a dimethyl tin JIETOKI side, a dimethyl tin JIPUROPOKI side and dimethyl tin — a jib — an ibis — a side and a dimethyl tin screw (2-ethylhexyl oxide). Dimethyl tin diallauryl oxide, dimethyl tin distearyl oxide, A dibutyl tin JIMETOKI side, a dibutyl tin JIETOKI side, a dibutyl tin JIPUROPOKI side, dibutyl tin — a jib — an ibis — a side and a dibutyl tin screw (2-ethylhexyl oxide). Dibutyl tin diallauryl oxide, dibutyl tin distearyl oxide, A dioctyl tin JIMETOKI side, a dioctyl tin JIETOKI side, a dioctyl tin JIPUROPOKI side, dioctyl tin — a jib — an ibis — a side and a dioctyl tin screw (2-ethylhexyl oxide). Dioctyl tin diallauryl oxide, dioctyl tin distearyl oxide, a diallauryl tin JIMETOKI side, a diallauryl tin JIPUROPOKI side, and diallauryl tin — a jib — an ibis — a side, a diallauryl tin screw (2-ethylhexyl oxide), diallauryl tin diallauryl oxide, diallauryl tin distearyl oxide, etc. are mentioned. These dialkyl tin JIARUKOKI sides are obtained by heating dialkyl tin oxide and corresponding alcohol and making them react under a nitrogen atmosphere. It is obtained by heating dialkyl tin oxide and ester compounds, such as phthalic acid octyl and lauric acid ethyl, and making them react under a nitrogen atmosphere.

[0018]As a dialkyl tin screw (dona RUKOKISHI silicate) expressed with a general formula (1), Specifically A dimethyl tin screw (trimethoxy silicate), a dimethyl tin screw (TORIETOKISHI silicate), A dimethyl tin screw (TORIBUTOKISHI silicate), a dibutyl tin screw (trimethoxy silicate), A dibutyl tin screw (TORIETOKISHI silicate), a dibutyl tin screw (TORIBUTOKISHI silicate), A dioctyl tin screw (trimethoxy silicate), a dioctyl tin screw (TORIETOKISHI silicate), A dioctyl tin screw (TORIBUTOKISHI silicate), a dilauryl tin screw (trimethoxy silicate), a dilauryl tin screw (TORIBUTOKISHI silicate), etc. are mentioned.

[0019]As a dialkyl tin screw (monoaalkyl dialkoxo silicate) expressed with a general formula (1), Specifically A dimethyl tin screw (methyl di ethoxysilicate), a dimethyl tin screw (ethyl diethoxy silicate), A dimethyl tin screw (butyl diethoxysilicate), a dibutyl tin screw (methyl di ethoxysilicate), A

among these.

[0027]In the moisture curing nature constituent of this invention, the content of a curing catalyst (B) has 0.1 - 10 preferred weight section to silyl group content organicity polymer (A) 100 weight section. When said less than range of hardening performance is [the quantity of a curing catalyst (B)] insufficient and it exceeds said range on the other hand, physical properties, such as recovery of the hardened material after hardening and weatherability, may worsen.

[0028]In order to promote hardening in the moisture curing nature constituent of this invention and to improve adhesion to a substrate, Can use publicly known various amino group substitution alkoxy silane compounds or the condensate of those, and specifically, gamma-aminopropyl trimethoxysilane, gamma-aminopropyl triethoxysilane, N-(trimethoxysilylpropyl) ethylenediamine, delta-aminobutyl (methyl) diethoxysilane, N,N'-bis(trimethoxysilylpropyl)ethylenediamine, these partial hydrolysates, etc. are mentioned.

[0029]Additive agents usually added by the hardenability constituent, such as a bulking agent, colorant, a plasticizer, a hardening accelerator, a concrete retarder, a dripping inhibitor, an antiaging agent, and a solvent, may be further added to the moisture curing nature constituent of this invention. As a bulking agent, specifically For example, calcium carbonate, kaolin, talc, Fumed silica, sedimentation nature silica, a silicic acid anhydride, hydrous silicic acids, clay, Calcination clay, glass, bentonite, organic bentonite, a milk balloon, glass fiber, asbestos, a glass filament, grinding quartz, diatomite, aluminum silicate, aluminum hydroxide, a zinc oxide, magnesium oxide, a titanium dioxide, etc. are mentioned. Specifically as colorant, iron oxide, carbon black, copper phthalocyanine blue, Phthalocyanine Green, etc. are mentioned. As a plasticizer, specifically Dibutyl phthalate, dioctyl phthalate, Phthalic ester, such as butylbenzyl phthalate, dioctyl adipate, Succinic acid dioctyl, succinic acid diisododecyl, diisododecyl sebacate, Glycol ester, such as aliphatic-carboxylic-acid ester species, such as butyl oleate, and pentaerythritol ester. Epoxy system plasticizers, such as phosphoric ester, such as trioctyl phosphate and trioresyl phosphate, epoxidized soybean oil, and epoxy stearic acid benzyl, a chlorinated paraffin, etc. are mentioned. Specifically as a dripping inhibitor, hydrogenation castor oil, a silicic acid anhydride, organic bentonite, colloidal silica, etc. are used. As other additive agents, adhesion grant agents, such as phenol resin and an epoxy resin, an ultraviolet ray absorbent, radical chain inhibitor, a peroxide decomposition agent, various kinds of antiaging agents, etc. are mentioned.

[0030]Although this invention is concretely explained based on an example below, the range of this invention is not limited by this.

[0031]Example of manufacture 1 thermometer, a reflux condenser, and an agitator in the 500-ml 4 Thu mouth flask which it had under a nitrogen air current, 49.8 g (0.2 mol) of dibutyltin oxide, 52.1 g (0.4 mol) of 2-ethylhexanol, And teach 200 g of toluene and it was made to react at 112 °C for 2 hours, and after carrying out azeotropy drying of the generated water, toluene was distilled off under decompression and light yellow transparent liquid A 92.4g (94% of yield) was obtained. This compound has checked generation of the dibutyl tin screw (2-ethylhexyl oxide) with the disappearance of absorption (3300-3400 cm^{-1}) of O-H of alcohol and the advent of absorption (805 cm^{-1}) of Sn-O-C in FT-IR.

[0032]In the same 4 mouth flask as the example 1 of example of manufacture 2 manufacture, 49.8 g (0.2 mol) of dibutyltin oxide, The acetic acid 24.0g (0.4 mol) and 200 g of toluene are taught. After carrying out reaction processing like the example 1 of manufacture, subsequently prepared 83.3 g (0.4 mol) of ethyl ortho silicate (tetraethoxysilane), it was made to react at 120 °C for 3 hours, decompression distilling off of the generated ethyl acetate was carried out, and light yellow transparent liquid B 114.7g (97% of yield) was obtained. This compound has checked generation of the dibutyl tin screw (TORIETOKISHI silicate) in FT-IR from the result of disappearance of absorption (1638 cm^{-1} , 1559 cm^{-1}) of tin carbonyl, and the next ultimate analysis.

[0033]

C(%) H(%) O(%) Si(%)Sn(%)

Measured value 40.5 8.2 21.7 9.5 20.1 Theoretical-value 40.6 8.2 21.6 9.5 20.1 [0034]49.8 g (0.2 mol) of dibutyltin oxide, 40.0 g (0.4 mol) of acetylacetone, and 200 g of toluene were taught to the same 4 mouth flask as the example 1 of example of manufacture 3 manufacture, it reacted and processed like the example 1 of manufacture, and light yellow transparent liquid C 81.1g (94% of yield) was

obtained. This compound has checked generation of the dibutyl tin screw (acetylacetone) with the advent of absorption (547 cm^{-1}) of Sn-O-C in FT-IR.

[0035]49.8 g (0.2 mol) of dibutyltin oxide, 52.1 g (0.4 mol) of ethyl acetoacetate, and 200 g of toluene were taught to the same 4 mouth flask as the example 1 of example of manufacture 4 manufacture, it reacted and processed like the example 1 of manufacture, and light yellow transparent liquid D 98.8g (97% of yield) was obtained. This compound has checked generation of the dibutyl tin screw (ethylacetoacetate) with the advent of absorption (550 cm^{-1}) of Sn-O-C in FT-IR.

[0036]49.8 g (0.2 mol) of dibutyltin oxide, 156.2 g (0.4 mol) of dioctyl phthalate, and 200 g of toluene were taught to the same 4 mouth flask as the example 1 of example of manufacture 5 manufacture, it reacted and processed like the example 1 of manufacture, and light yellow transparent liquid E 199.8g (97% of yield) was obtained. This compound has checked generation of dibutyl tin dioctyl oxide with the advent of absorption (550 cm^{-1}) of Sn-O-C in FT-IR.

[0037]Instead of the dibutyltin oxide of the example 2 of example of manufacture 6 manufacture, 72.2 g (0.2 mol) of dioctyl tin oxide was used, it reacted and processed by the same combination as the example 2 of manufacture, and light yellow fluid F 136.5g (97% of yield) was obtained. This compound has checked generation of the dioctyl tin screw (TORIETOKISHI silicate) in FT-IR from the result of disappearance of absorption (1638 cm^{-1} , 1559 cm^{-1}) of tin carbonyl, and the next ultimate analysis.

[0038]

C(%) H(%) O(%) Si(%)Sn(%)

Measured value 47.7 9.3 17.9 8.1 17.0 Theoretical-value 47.8 9.2 18.1 8.0 16.9 [0039]Instead of the dibutyltin oxide of the example 4 of example of manufacture 7 manufacture, 72.2 g (0.2 mol) of dioctyl tin oxide was used, it reacted and processed by the same combination as the example 4 of manufacture, and light yellow fluid G 104.3g (96% of yield) was obtained. This compound has checked generation of the dioctyl tin screw (ethylacetoacetate) with the advent of absorption (547 cm^{-1}) of Sn-O-C in FT-IR.

[0040]Instead of the dibutyltin oxide of the example 2 of example of manufacture 8 manufacture, 33.0 g (0.2 mol) of dimethyl tin oxide was used, it reacted and processed by the same combination as the example 2 of manufacture, and the light yellow fluid H99.4g (98% of yield) was obtained. This compound has checked generation of the dimethyl tin screw (TORIETOKISHI silicate) in FT-IR from the result of disappearance of absorption (1638 cm^{-1} , 1559 cm^{-1}) of tin carbonyl, and the next ultimate analysis.

[0041]

C(%) H(%) O(%) Si(%)Sn(%)

Measured value 33.2 7.3 25.1 11.1 23.3 Theoretical-value 33.2 7.1 25.2 11.1 23.4 [0042]the tin compounds A-H obtained in the examples 1-12 of an experiment and the example 1 of comparative experiments - the examples 1-8 of 8 <stability test of catalyst> manufacture -- to 50 weight sections, respectively, What (examples 1, 3, 5, 7, 9-12 of an experiment) mixed ethyl ortho silicate (tetraethoxysilane) 50 weight section, and tin compound A-D obtained in the examples 1-4 of manufacture -- to 50 weight sections, respectively, What (examples 2, 4, 6, and 8 of an experiment) mixed ethyl silicate 40 (poly silicic acid ethyl ester by Tama Chemicals Co., Ltd. (4 - pentamer)) 50 weight section, And what does not add a tetraethoxysilane and the ethyl silicate 40 to tin compound A-H obtained in the examples 1-8 of manufacture as a comparative example (examples 1-8 of comparative experiments) was put into the transparent glass bottle, was settled at the room temperature, and it passed through the state, and compared by the time. The judgment of the state was performed based on the following standard. A result is shown in Table 1.

O : a clear state.

** : Thickening or nebula arose.

x : Gelling or precipitate arose.

[0043]

[Table 1]

配合割合(重量部比)			外 報									
正雄鐵 エチル 50	三硝小 ケトル40	錳化合物	1日後	3日後	5日後	7日後	14日後	1ヶ月後	2ヶ月後	3ヶ月後		
			Q	Q	△	△	×	×	×	×		
東鉄例1	錳化合物A	50	Q	Q	△	△	× <td>×<td>×<td>×</td></td></td>	× <td>×<td>×</td></td>	× <td>×</td>	×		
東鉄例2	錳化合物A	50	Q	Q	△	△	× <td>×<td>×<td>×</td></td></td>	× <td>×<td>×</td></td>	× <td>×</td>	×		
東鉄例3	錳化合物B	50	Q	Q	Q	Q	Q	Q	Q	Q		
東鉄例4	錳化合物B	50	Q	Q	Q	Q	Q	Q	Q	Q		
東鉄例5	錳化合物C	50	Q	Q	Q	Q	△	△	△	△		
東鉄例6	錳化合物C	50	Q	Q	Q	Q	Q	△	△	△		
東鉄例7	錳化合物D	50	Q	Q	△	△	× <td>×<td>×<td>×</td></td></td>	× <td>×<td>×</td></td>	× <td>×</td>	×		
東鉄例8	錳化合物D	50	Q	Q	△	△	× <td>×<td>×<td>×</td></td></td>	× <td>×<td>×</td></td>	× <td>×</td>	×		
東鉄例9	錳化合物E	50	Q	Q	Q	Q	Q	Q	Q	Q		
東鉄例10	錳化合物F	50	Q	Q	Q	Q	Q	Q	Q	Q		
東鉄例11	錳化合物G	50	Q	Q	△	△	× <td>×<td>×<td>×</td></td></td>	× <td>×<td>×</td></td>	× <td>×</td>	×		
東鉄例12	錳化合物H	50	Q	Q	Q	Q	Q	Q	Q	Q		
比較東鉄例1	錳化合物A	100	△	× <td>×<td>×<td>×<td>×<td>×<td>×</td></td></td></td></td></td>	× <td>×<td>×<td>×<td>×<td>×</td></td></td></td></td>	× <td>×<td>×<td>×<td>×</td></td></td></td>	× <td>×<td>×<td>×</td></td></td>	× <td>×<td>×</td></td>	× <td>×</td>	×		
比較東鉄例2	錳化合物B	100	Q	Q	Q	Q	Q	△	△	△		
比較東鉄例3	錳化合物C	100	Q	Q	Q	Q	× <td>×<td>×<td>×</td></td></td>	× <td>×<td>×</td></td>	× <td>×</td>	×		
比較東鉄例4	錳化合物D	100	△	× <td>×<td>×<td>×<td>×<td>×<td>×</td></td></td></td></td></td>	× <td>×<td>×<td>×<td>×<td>×</td></td></td></td></td>	× <td>×<td>×<td>×<td>×</td></td></td></td>	× <td>×<td>×<td>×</td></td></td>	× <td>×<td>×</td></td>	× <td>×</td>	×		
比較東鉄例5	錳化合物E	100	Q	Q	Q	Q	Q	△	△	△		
比較東鉄例6	錳化合物F	100	△	× <td>×<td>×<td>×<td>Q</td><td>△</td><td>△</td></td></td></td>	× <td>×<td>×<td>Q</td><td>△</td><td>△</td></td></td>	× <td>×<td>Q</td><td>△</td><td>△</td></td>	× <td>Q</td> <td>△</td> <td>△</td>	Q	△	△		
比較東鉄例7	錳化合物G	100	Q	× <td>×<td>×<td>×<td>Q</td><td>×<td>×</td></td></td></td></td>	× <td>×<td>×<td>Q</td><td>×<td>×</td></td></td></td>	× <td>×<td>Q</td><td>×<td>×</td></td></td>	× <td>Q</td> <td>×<td>×</td></td>	Q	× <td>×</td>	×		
比較東鉄例8	錳化合物H	100	Q	Q	Q	Q	Q	Q	△	△		

[0044] Examples 1-12, one to comparative example 8 Examples 1, 2, 7, 8, and 11, and the comparative examples 1, 4, and 7 the catalyst after an end for stability test three days, Examples 5 and 6 and the comparative example 3 the catalyst after the end of stability test 21 day with the compounding ratio to which Examples 3, 4, 9, 10, and 12 and the comparative examples 2, 5, 6, and 8 show the catalyst after the end of stability test three months in various materials and Table 2 The room temperature of 25 °C. It was neglected after kneading in the thermostatic chamber of 60% of humidity, and a snap loss (time until it becomes a letter of half-gelling), and tack free time (time until surface tackiness is lost) were measured. A result is shown in Table 2. The material in Table 2 expresses the following thing.

[0045]MS polymer S303: The polymer containing a hydrolytic silicon group (made by Kaneka Corp.)
NOKURAKKU NS-6 : Antiaging agent (product made from Ouchi Shinko Chemical Industry)
DOP : — dioctyl phthalate A-1100 : Amino group substitution alkoxy silane compound (made by Nippon Unicar)

[0046]

[[Table 2]]

[illegible]

[0047] The hardenability constituent (examples 1-12) which uses the catalyst which consists of the dialkyl tin compound and silicate compound of this invention so that clearly from Table 1 and Table 2, Compared with the hardenability constituent (comparative examples 1-8) which contains only a dialkyl tin compound as a catalyst, it is stable in the air and it turns out that catalytic activity is not deactivated for a long period of time.

[0048]

[W448]
[Effect of the Invention]In the air, catalytic activity is not lost for a long period of time, but the moisture curing nature constituent of this invention is useful as a sealing agent, a coating agent, and elastic adhesives.

[Translation done.]